Serial No.: 09/768,374 Attorney's Docket No.: 10559/370001/P10176
Intel Corporation

REMARKS

Claims 1-30 are pending, with claims 1, 8, 11, 21, and 28 being independent. Reconsideration and allowance of the above-referenced application are respectfully requested.

Claim Rejections Under 35 U.S.C. 112:

Claims 1-7 and 11-30 stand rejected under 35 U.S.C. 112, first paragraph, as allegedly failing to comply with the written description requirement. This contention is respectfully traversed.

In the previous response, the following underlined language was added to the wherein clause of claim 1: "wherein the first and second protocols comprise first and second transport-layer, connection-oriented, byte stream based protocols, the proxy node manages first and second endpoints corresponding to the first and second protocols, and the translating comprises relaying a byte stream and maintaining byte stream order over the first and second protocols." The first and second transport-layer, connection-oriented protocols are byte stream based protocols. For example, in TCP/IP (Transmission Control Protocol / Internet Protocol), there is often a dependence from one packet to the next in a connection established at the transport layer.

Claim 1 recites, "the proxy node manages first and second endpoints corresponding to the first and second protocols." As is clearly described in the specification, the proxy node performs connection association such that a flow of packets is identified and translated from the first to second protocols. (*See e.g.*, specification at page 9, lines 12-20; and page 12, line 18 to page 13, line 9.) Thus, the proxy node bridges two transport endpoints using two different transport layer protocols, where the translation of a packet involves identifying the flow to determine the associated connection for the packet.

The byte stream being relayed during the translation can span multiple packets, and the byte stream order is maintained over the first and second protocols during the translation of a packet because the larger context of the packet is taken into consideration during the translation. (*See e.g.*, specification at page 4, line 3 to page 5, line 21.) The previously added claim language clearly articulates this aspect of the claimed subject matter and is clearly supported by the specification.

The Official Action includes a request for further explanation of how byte stream order is maintained. As described in detail in the specification, a series of queues are used to hold data in the course of translation from one protocol

to another, where the translation and queuing are connection aware. (*See e.g.*, specification at page 10, line 4 to page 22, line 20.) The proxy node manages first and second endpoints corresponding to the first and second protocols, and the proxy node can maintain byte stream order of data during the translation using the described queues, such as the transmission control block (TCB) send queue, TCB receive queue, and resequencing queue. By relaying the byte streams and maintaining byte stream order in the translating, the streaming semantics of the byte stream based protocol are maintained, which provides a higher level of transparency for the proxy node. In view of the above, reconsideration of this rejection of claim 1 is respectfully requested.

With respect to claims 11, 21, and 28, the Official Action suggests that the underlined language in the following excerpt from claim 11, which language appears in each of claims 11, 21 and 28, is not supported by the specification: "if the first packet meets a specified criterion relating to whether a connection has already been established between the network client and the proxy node using the first protocol, translating the first packet using a second protocol used by the application node, and sending the translated first packet to the application node". The Office Action then states that, upon review of the

specification, the "closest functionality was related to receiving a packet, and then determining whether or not a connection has been established before continuing processing; that is, the packet doesn't meet the criteria of whether or not the connection has been established but rather a connection is simply checked to see if it exists before the system continues." Attention is called to the claim language, "relating to", which has been omitted from the Office Action's paraphrasing of the claim. The specification, including the portion referred to in the Office Action, fully supports the claim language as written. In view of the above and also the discussion of this claimed subject matter below on pages 13 and 14 of this Response, reconsideration of this rejection of claims 11, 21, and 28 is respectfully requested.

With respect to claims 19 and 20, the Official Action suggests that the underlined language below is not supported by the specification:

> 19. The system of claim 18 wherein each network node comprises a processor configured for performing load balancing among the proxy nodes based on protocol processing requirements."
>
> 20. The system of claim 19 wherein the proxy node processors are further configured for performing load

balancing among the application nodes based on application processing requirements.

However, the underlined portions of these claims have not been changed from the originally filed claims, which form part of the specification. Thus, these claims are self supporting with respect to the written description requirement, and the rejection should be withdrawn for at least this reason. If believed desirable by the Patent Office, the subject matter of these claims will be copied into the specification.

In addition, the specification provides clear support for these claims:

> SANs [system area networks] 14 incorporating the techniques described above can incorporate two levels of load balancing. At one level, the network nodes 16a ... 16k can perform session level load balancing on a group of proxy nodes 18a ... 18k using network address translation techniques or Internet protocol tunneling techniques. At a second level, each proxy node 18a ... 18k can perform application level load balancing on a group of application nodes 20a, 20b, 20c ... 20k.

The "session level load balancing" and the "application level load balancing" here are clearly describing load balancing at the transport layer among the proxy nodes and the application

nodes, respectively. The proxy nodes handle the protocol processing involved in translating from the first transport-layer, connection-oriented, byte stream based protocol to a second transport-layer, connection-oriented, byte stream based protocol; and the application nodes host various applications, such as a web service, mail service, or directory service. (See specification at page 2, line 23 to page 3, line 4.) Thus, the load balancing among the proxy nodes can be based on protocol processing requirements, and the load balancing among the application nodes can be based on application processing requirements, as described and claimed in the specification.

In view of the above comments, withdrawal of the 112 rejection of claims 1-7 and 11-30 is respectfully requested.

Claim Rejections Under 35 U.S.C. 102 and 103:

Claim 8 stands rejected under 35 U.S.C. 102(e) as allegedly being anticipated by Haviv (US Patent Pub. No. 2002/0059451). Claims 1 and 6-7 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Haviv in view of Garcia et al. (US Patent No. 6,493,343). Claims 11-16, 18, 21-25 and 27-30 appear to stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Haviv. Claims 2 and 3 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over

Haviv and Garcia in view of Ketcham (US Patent No. 6,721,324). Claims 4, 5, 9, 10, 17 and 26 stand rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Haviv and Garcia in view of Speight et al., (4th USENIX Windows Systems Symposium Paper 2000, Pp. 113-124 of the Proceedings, August 3-4, 2000). Claim 19 stands rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Haviv and Garcia in view of Squire et al. (US Patent No. 6,745,243). Claim 20 stands rejected under 35 U.S.C. 103(a) as allegedly being unpatentable over Haviv, Garcia and Squire in view of Nelson (US Patent No. 6,882,654). These contentions are respectfully traversed.

With respect to independent claim 8, the Response to Arguments section of the Official Action states: "As is well known in the art, an HTTP request is analogous to a transport-layer control packet." (*See* the Office Action mailed 06/16/2005 at page 3.) No evidence is offered for this statement, and no explanation is provided of how this "analogous" element can satisfy the all-elements requirement for a 102 rejection. It appears that the Official Action is in fact presenting an obviousness rejection of claim 8.

Attention is called to *In re Lee*, 277 F.3d 1338 (Fed. Cir. 2002), in which the Federal Circuit vacated a Patent Office Board affirmance of an obviousness rejection because, rather

than relying on objective evidence, the Patent Office based its obviousness rejection on conclusory statements having no evidentiary support in the record. *Id.* at 1342-43. In doing so, the Federal Circuit made it abundantly clear that "subjective belief and unknown authority" and "[assertions of] common knowledge and common sense" are not "a substitute for evidence." *Id.* at 1343-44.

Independent claim 8 recites, "sending a response from the proxy node to the first node using the first protocol, if said processing results in a determination that the packet comprises a transport-layer control packet that need not be translated and sent to the second node". (Emphasis added.) The server cache functionality of the proxy described in Haviv (*see* Haviv at ¶ 0058.) does not describe this claimed subject matter, and an HTTP request is not a transport-layer control packet. Thus, independent claim 8 should be in condition for allowance. Dependent claims 9 and 10 are patentable for at least the above reason, and based on their own merits.

With respect to independent claim 1, the Official Action acknowledges that Haviv does not disclose maintaining byte stream order over the first and second protocols and goes on to suggest that Garcia does. Garcia describes a system and method for facilitating both in-order and out-of-order packet reception

in a system area network (SAN), which includes requester and responder nodes that maintain local copies of a message sequence number. "Each request packet includes an ordering field specifying whether the packets must be received in-order. The request node includes a copy of the local sequence number in each packet transmitted and increments its local copy of the sequence number only for packets that must be received in order. The responder node includes the received message sequence number in all response packets and increments its local copy of the message sequence number only if the ordering field specifies that the packets must be received in order." (*See* Garcia at Abstract, and col. 1, lines 48-60.)

In addition, "According to another aspect of the invention, RDMA [remote direct memory access] transactions may be implemented utilizing multiple paths to increase bandwidth." (*See* Garcia at col. 1, lines 65-67.) With respect to the ordering of RDMA packets, which is the portion of Garcia being relied upon, an RDMA packet contains the address to which the destination end node writes the packet contents, which allows multiple RDMA packets within an RDMA message to complete out of order. "RDMA request packets may be sent ordered or unordered." (*See* Garcia at col. 7, lines 26-34.) Garcia is thus describing alternative approaches to sending RDMA request packets over a

network and is not related to translating from one protocol to another. The in-order delivery of data packets using a single protocol, as described in Garcia, does not describe maintaining byte stream order over the first and second protocols, as claimed.

Moreover, there is no motivation to combine Garcia with Haviv as suggested in the Official Action. The motivation given in the Official Action is that "the benefits and advantages of in-order delivery are already well known and appreciated in the art." However, out of order delivery can also have advantages, and the Official Action does not explain how the advantage of in-order delivery, as identified in Garcia, is relevant to Haviv. Garcia suggests sending RDMA packets strictly ordered for smaller RDMA transfers. (*See* Garcia at col. 7, lines 55-60.) No line of reasoning has been provided as to why or how this potential advantage of strict ordering in Garcia is applicable to Haviv, let alone why this would lead someone skilled in the art to modify Haviv to maintain byte stream order over the first and second protocols, as claimed. Thus, the Patent Office has not met its initial burden in attempting to establish that these references should be combined to establish a prima facie case of obviousness.

Furthermore, the Official Action suggests in the Response to Arguments section that Haviv may in fact teach maintaining byte stream order over the first and second protocols (contrary to what is stated later in the rejection of claim 1 based on Garcia). (*See* the Office Action mailed 06/16/2005 at page 3.) Haviv mentions that a proxy element may be used to generate transactions instead of a client. (*See* Haviv at ¶ 0051.) But Haviv fails to provide relevant details of how to translate from one protocol to another on the proxy element, and Haviv fails to explicitly link the transactions generated by the proxy element with the example Winsock protocol mentioned in ¶ 0045. In fact, Haviv goes on to state that the proxy element may convert packet/frame-oriented communications to "transaction-oriented communications, and/or to implement RDMA operations." (*See* Haviv at ¶ 0053.)

This mention of RDMA, and the fact that Haviv is directed to a system that enables filtered peer-to-peer communication, in which the system may be implemented as an efficient multi-channel reliable network having RDMA capabilities (*see* Haviv at ¶ 0014), teaches away from the expansive interpretation of Haviv suggested in the Office Action. The focus in Haviv on an efficient multi-channel reliable network having RDMA capabilities suggests the use of the out-of-order capabilities

of RDMA. Haviv thus suggests a decoupling between the two sides of the translation, thereby teaching away from maintaining byte stream order over the first and second protocols. Moreover, the servers in Haviv are proxy aware (*see* Haviv at ¶ 0059), which tends to strengthen this conclusion. Haviv and Garcia fail to teach or suggest the presently claimed maintaining of byte stream order over first and second protocols during translation, which allows the proxy node to operate transparently between the network nodes and the application nodes.

In view of the above, independent claim 1 should be in condition for allowance. Dependent claims 2-7 are patentable for at least the above reasons, and based on their own merits. For example, claims 2 and 3 are patentable over the proposed combination of Haviv, Garcia and Ketcham. Ketcham describes aggregating and de-aggregating packets within a router in a network. Ketcham does not describe packet translation, such as "translating a single packet into multiple packets" or "translating the multiple packets into a single packet", as recited in claims 2 and 3. Packet aggregation is not equivalent to packet translation between protocols. Moreover, a prima facie case of obviousness has not been established because no proper motivation to combine these references has been

established, and there is not a reasonable expectation of success for the proposed combination.

With respect to independent claims 11, 21 and 28, the Official Action states that the claimed criterion "seems to have implicitly been checked. The previous limitation disclosed receiving at a proxy node a first packet from the client using a first protocol. Since the proxy node has received the first packet using a first protocol, this seems to mandate that the connection between the client and the proxy node has been established using the first protocol. [...] Appropriate explanation is requested if Applicant believes that Examiner has interpreted the claim language incorrectly." (*See* the Office Action mailed 06/16/2005 at page 4.)

In some network protocols, establishing a connection between two network nodes requires more than just a single packet being received, and thus receipt of a packet using a protocol does not imply a connection has already been established. For example, in TCP/IP, establishing a connection involves a three way handshake including a synchronization (SYN) packet, a synchronization plus acknowledgement (SYN+ACK) packet, and finally an acknowledgement (ACK) packet. Thus, receipt of a first packet using a first protocol from a client does not

necessarily mean that a connection has been established with that client.

An example of the claimed subject matter here is clearly shown and described in connection with Figure 5 of the present application. As illustrated in this example, the proxy node 18a in fact receives two packets using the first protocol (a SYN packet and an ACK packet) that do not result in any immediate translation to the second protocol. In view of this clarification, and in light of Haviv's failure to teach or suggest the possibility of packet conversion being conditional, independent claims 11, 21 and 28 should be in condition for allowance.

Dependent claims 12-20, 22-27, 29 and 30 are patentable for at least the above reasons, and based on their own merits. For example, claim 19 defines multiple network nodes in a system area network (SAN) where each network node performs load balancing among the proxy nodes in the system area network based on protocol processing requirements. This load balancing is at the connection level, and load is balanced across proxy nodes that do transport-layer protocol translation. In view of the clarification of the subject matter of claim 19 above, it should be clear that the network address translation techniques of Squire are very different from the claimed subject matter.

With respect to claim 20, Nelson describes an apparatus employing an efficient buffering scheme for analyzing the Layer 7 content in packet data sent from a first node to a second node within a computer network. (*See* Nelson at Abstract.) The load balancing described in Nelson is based on the result of a search that a Layer 7 switch performs on a database or table for one or more data fields within a received packet data, in order to find a set of servers that are configured to receive and handle such packet data. (*See* Nelson at col. 1, lines 11-41; and col. 5, lines 27-43.) Thus, Nelson does not describe load balancing based on application processing requirements, as claimed. Moreover, a prima facie case of obvious has not been established that the four cited references, all relating to different technologies, could somehow be combined to result in the multi-level, distributed load balancing of claim 20; a first level being network nodes in a SAN that balance load across proxy nodes in the SAN based on protocol processing requirements, and a second level being the proxy nodes in the SAN that balance load across application nodes in the SAN based on application processing requirements.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific issue or comment does not signify agreement with or concession of that

issue or comment. Because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

It is respectfully suggested for all of these reasons, that the current rejections are overcome, that none of the cited art teaches or suggests the features which are claimed, and therefore that all of these claims should be in condition for allowance. A formal notice of allowance is thus respectfully requested.

No fees are believed due. Please apply any necessary charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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